Build Your Own Anemometer

Introduction

How fast is the wind blowing? How can wind speed be measured? In this activity, a handheld anemometer will be constructed to answer these questions.

Concepts

- Wind speed
- Anemometers

Materials

Colored marker
Colored paper, 1 sheet
Glue stick
Hot glue gun
Paper clip
Paper punch
Plastic medicine cups or small paper drinking cups, 4
Sharpened pencil with eraser
Stapler (optional)
Straws, 2
Tape
Thin nail or pushpin

Safety Precautions

Although this demonstration is considered nonhazardous, please follow normal safety guidelines.

Procedure

1. Obtain four medicine cups. Use a paper punch to punch one hole in each cup roughly a half inch below each rim.
2. Push a straw through the hole of one of the cups. Hot glue the end of the straw to the inside wall of the cup. Also glue the straw to the side of the cup where the hole was punched (see Figure 1).
3. Place and hot glue another cup at the opposite end of the straw used in step 2. Be sure that the mouths of the cups are facing in opposite directions (see Figure 2).
4. Repeat steps 2 and 3 with two more cups and a straw.
5. Glue the two straw and cup assemblies together at their midpoints according to Figure 3.
6. Let the glue dry and punch a hole through the midpoint of the two straws using a thin nail or a pushpin.
7. Partially straighten a paper clip and place it through the hole where the straws intersect.
8. Push the end of the clip into the eraser of a pencil (see Figure 4).
9. Cut out and tape a small piece of colored paper to the back of one of the cups. This cup will be used to count the number of revolutions per minute of the anemometer.

Disposal

The assembled anemometer may be saved for future use.

Tips

- The constructed anemometer may be held by hand or may be pushed into the ground or into modeling clay for support.
- Small Dixie®-type cups also work well for this activity.
- The straws may be stapled to the cups instead of glued.
- This anemometer will only give a good approximation of wind velocity. More accurate anemometers are available

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Discussion

The constructed anemometer will rotate at the same speed as the wind. Count the number of times the colored cup spins around in one minute. This value will be the number of revolutions per minute. Measure, in feet, the circumference of the circle ($C = \pi \times D$) produced by the spinning cups. Multiply the revolutions per minute by the circumference of the circle. This will give you the velocity of the wind in feet per minute. This value can than be converted to miles per hour. See the example calculation below.

Example

$$C = \pi \times 0.75 \text{ ft} = 2.4 \text{ ft}$$

$$\frac{150 \text{ revolutions}}{\text{min}} \times \frac{2.4 \text{ ft}}{\text{revolutions}} = 360 \text{ feet per minute}$$

$$\frac{360 \text{ ft}}{\text{min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{1 \text{ mile}}{5280 \text{ ft}} = \sim 4 \text{ miles per hour (mph)}$$

Materials for *Build Your Own Anemometer* are available from Flinn Scientific, Inc.

Catalog No.	Description
AP5442	Polypropylene Cups, 500/pkg
AP6025	Straws, Wrapped, 500/pkg
AP1816	Hole-Punch, Single
FB0507	Anemometer, Pocket
FB0508	Anemometer, Working Model

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.